

Claims

1. An isolated nucleic acid molecule selected from the group consisting of:
  - (a) nucleic acid molecules comprising the nucleotide sequence of SEQ ID NO:1;
  - (b) nucleic acid molecules encoding a peptide having the amino acid sequence of SEQ ID NO: 2, or a variant, derivative and/or fragment thereof having the function of HMGCoA reductase inhibitor, phosphomevalonate inhibitor, reducing the accumulation of cholesterol in the cholesterol biosynthesis pathway and/or reducing the level of serum cholesterol;
  - (c) nucleic acid molecules which hybridize to a nucleic acid molecule complementary to the nucleic acid molecule of (a), or (b) or fragment thereof, and which encode a peptide having the function of HMGCoA reductase inhibitor, phosphomevalonate inhibitor, reducing the accumulation of cholesterol in the cholesterol biosynthesis pathway and/or reducing the level of serum cholesterol;
  - (d) nucleic acid molecules comprising a nucleotide sequence having at least 40% identity with the sequence of SEQ ID NO:1 or a fragment thereof and which encode a peptide having the function of HMGCoA reductase inhibitor, phosphomevalonate inhibitor, reducing the accumulation of cholesterol in the cholesterol biosynthesis pathway and/or reducing the level of serum cholesterol.
2. The nucleic acid molecule of claim 1, wherein the nucleic acid molecule (b) encodes at least a peptide having the amino acid sequence of SEQ

ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12 or SEQ ID NO:13.

3. The nucleic acid molecule of claims 1-2, wherein the nucleic acid molecule (d) comprises a nucleotide sequence having at least 40%, 50%, 60%, 70%, 80% or 90% identity with the sequence of SEQ ID NO:1 or a fragment thereof and which encode a peptide having the function of HMGCoA reductase inhibitor, phosphomevalonate inhibitor, reducing the accumulation of cholesterol in the cholesterol biosynthesis pathway and/or reducing the level of serum cholesterol.
4. The nucleic acid molecule of claims 1-3, wherein the nucleic acid molecule is a single or double strand polynucleotide, oligonucleotide, genomic DNA, cDNA, RNA, mRNA.
5. An expression vector, comprising at least one of the nucleic acid molecules (a), (b), (c), (d) of claim 1.
6. The expression vector of claim 5, wherein the expression vector further comprises a regulatory nucleic acid sequence.
7. The expression vector of claims 5-6, wherein the regulatory nucleic acid sequence is linked to the nucleic acid molecule encoding the polypeptide.
8. The expression vector of claims 5-7, wherein the regulatory nucleic acid is a prokaryotic or eukaryotic promoter.
9. The expression vector of claims 5-8, wherein at least two from the nucleic acid molecules of (a), (b), (c) and (d) are fused together in the vector.

10. A host cell, wherein the host cell comprises the vector of claims 5-9.
11. The host cell of claim 10, wherein the host cell is in the form of cell culture.
12. The host cell of claims 10-11, wherein the host cell is a prokaryotic or eukaryotic cell.
13. The host cell of claims 10-12, wherein the host cell is cultured to express a peptide having the amino acid sequence of SEQ ID NO: 2, or a variant, derivative and/or fragment thereof having the function of HMGCoA reductase inhibitor, phosphomevalonate inhibitor, reducing the accumulation of cholesterol in the cholesterol biosynthesis pathway and/or reducing the level of serum cholesterol.
14. The host cell of claims 10-13, wherein the host cell express at least a peptide having the amino acid sequence of SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12 or SEQ ID NO:13.
15. An isolated peptide comprising the amino acid sequence of SEQ ID NO: 2, or a variant, derivative and/or fragment thereof having the function of HMGCoA reductase inhibitor, phosphomevalonate inhibitor, reducing the accumulation of cholesterol in the cholesterol biosynthesis pathway and/or reducing the level of serum cholesterol.
16. The peptide of claim 15, wherein the peptide comprises the amino acid sequence of SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12 or SEQ ID NO:13.

17. The peptide of claims 15-16, wherein the peptide is a fused peptide and comprises at least one peptide having the sequence of SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12 or SEQ ID NO:13.
18. The peptide of claims 15-17, wherein the peptide is isolated and/or purified from a human or non-human animal species.
19. The peptide of claims 15-18, wherein the peptide is isolated and/or purified from the venom.
20. The peptide of claim 19, wherein the venom is from *Buthus martensi* Karsch.
21. The peptide of claim 15-20, wherein the peptide is obtained from steps comprising:
  - obtaining crude venom;
  - carrying out gel filtration; and
  - performing reverse-phase high performance liquid chromatography.
22. The peptide of claim 15-21, wherein the molecular weight of the peptide is 16803 Da, 16790 Da ; 16791 Da or 17211 Da.
23. The peptide of claim 15-22, wherein the peptide is isolated and/or purified from biological material, expressed from recombinant DNA, and/or prepared by chemical synthesis.
24. An isolated peptide, wherein the peptide has the function of HMGCoA reductase inhibitor, phosphomevalonate inhibitor, reducing the accumulation of cholesterol in the cholesterol biosynthesis pathway

and/or reducing the level of serum cholesterol, and wherein the peptide has a molecular weight of 16803 Da, 16790 Da, 16791 Da or 17211 Da.

25. The isolated peptide of claim 24, wherein the peptide is isolated and/or purified from the venom of *Buthus martensii* Karsch.
26. A pharmaceutical preparation comprising the peptide of claims 15-25.
27. The pharmaceutical preparation of claim 26, wherein the pharmaceutical preparation further comprises a pharmaceutically acceptable carrier, diluent, excipient or a combination thereof.
28. The pharmaceutical preparation of claims 26-27, wherein the pharmaceutically preparation is in the form of oral, parenteral, injection, topical, and/or implant preparation.
29. Use of at least one peptide comprising the amino acid sequence of SEQ ID NO: 2, or a variant, derivative and/or fragment thereof having the function of HMGCoA reductase inhibitor, phosphomevalonate inhibitor, reducing the accumulation of cholesterol in the cholesterol biosynthesis pathway and/or reducing the level of serum cholesterol, for the preparation of a medicament for the treatment or prophylaxis of disorders characterised by the accumulation of cholesterol, its by-product and/or related lipid derived products.
30. The use of claim 29, wherein the medicament comprises at least one peptide or a fused peptide comprising the amino acid sequence of at least one of SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12 and SEQ ID NO:13.

31. Use of at least one peptide of claims 15-25 for the preparation of a medicament for the treatment or prophylaxis of disorders characterised by the accumulation of cholesterol, its by-product and/or related lipid derived products.
32. The use of claims 29-31, wherein the by-product comprises bile acid.
33. The use of claims 29-32, wherein the related lipid derived products comprises HDL, LDL and/or VLDL.
34. The use of claims 29-33, wherein the disorders comprise hypertension, atherosclerosis, stroke, neurovascular and/or cardiovascular disorders.
35. The use of claims 29-34, wherein the medicament further comprises a pharmaceutically acceptable carrier, diluent, excipient or a combination thereof.
36. The use of claims 29-35, wherein the medicament is administered locally, by injection, implantation, topical administration to a tissue locus, parenterally and/or orally.
37. A use of at least one peptide comprising the amino acid sequence of SEQ ID NO: 2 for the preparation of a medicament for the treatment for cholesterol independent and pleiotropic conditions.
38. The use of claim 37, wherein the medicament comprises at least one peptide or a fused peptide comprising the amino acid sequence of at least one of SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12 and SEQ ID NO:13.

39. Use of at least one peptide of claims 15-25 for the preparation of a medicament for the treatment for cholesterol independent and pleiotropic conditions.
40. The use of claims 37-39, wherein the cholesterol independent and pleiotropic condition comprise atherosclerotic stabilization, amelioration of endothelial dysfunction, improved coronary artery compliance, prevention of plaque rupture, and/or thrombus formation.